

Chapter 3 Factors and Products**3.8 Factoring Special Polynomials**

There are a few types of special polynomials that we are going to look at. The first type is **perfect square trinomials**. All of this type can be written in factored form of a binomial squared.

To explore this type, expand the following:

A **perfect square** has the following form:

$$(a + b)^2 =$$

OR

$$(a - b)^2 =$$

FoIL

To identify a perfect square trinomial:

- 1) The first *and* last term must be perfect squares.
- 2) The middle term must be twice the product of the square roots of the first and last terms. (i.e. $2ab$)

Example: $4x^2 + 20x + 25 = (2x + 5)^2$

Example:

- 1) Factor each trinomial. Which trinomials are **perfect squares**?

a) $y^2 + 10y + 25$

b) $4t^2 + 4t + 1$

c) $16x^2 + 24x + 9$

d) $y^2 + 3y + 2$

We will also encounter **trinomials with 2 variables** and the method we can use to factor this type is decomposition.

e) $36m^2 - 60mn + 25n^2$

A **perfect square** can also exist as a **difference of squares**:

$$a^2 - b^2$$

$$(a - b)(a + b)$$

FOIL